University Publication Centre (UPENA)
UNIVERSITI TEKNOLOGI MARA

ESTEEM

Academic Journal UiTM Pulau Pinang

Volume 2 2005 ISSN 1675-7939

A Study on Compressive Strength of Concrete Cointaining MK7003 with Various Water Binder Ratio — Clotilda Petrus, Amer Yusuff, Ahmad Fairuz Othman, Ahmad Ikhwan Naim Mohd Zin

Designing Reinforced Earth Wall for Seismic Areas — Iqraz Nabi Khan, Swami Saran, Caroline Peter Diman

Study on Nylon Strip-soil Interaction — Iqraz Nabi Khan, Swami Saran

Sampling of Beach Sand in Kerteh, Terengganu — M.F. Ahmad, N.A. Zakaria, M.R. Selamat

A Study on the Relationship between Correlation Coefficient and Inverse Regression — Ng Set Foong, Teoh Sian Hoon

A New Finite Difference Scheme Based on Centroidal Mean Averaging for the Goursat Problem — Mohd Agos Salim Nasir, Ahmad Izani Md Ismail

A Comparative Study between Cu and Pb in the Speciation Study of Heavy Metals in a Stabilization Pond Treating Household Wastewater — Lim Boon Tik

Design of Road Humps in Residential Area — Muhammad Akram Adnan, Teoh Sian Hoon, Lim Boon Tik

A Study of Temperature Variation in Closed Cars — Nor Hanim Abdul Rahman, Mohd Rozaiman Aziz, Suzana Ab. Rahim

© ESTEEM Academic Journal is jointly published by the Universiti Teknologi MARA, Pulau Pinang and Pusat Penerbitan Universiti (UPENA), Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia.

ESTEEM

Academic Journal UiTM Pulau Pinang

Volume 2 **2005** **ISSN 1675-7939**

Editorial Team i
Foreword by The Chief Editor v

1. A Study on Compressive Strength of Concrete Cointaining MK7003 with Various Water Binder Ratio 1
   Clotilda Petrus, Amer Yusuff, Ahmad Fairuz Othman & Ahmad Ikhwan Naim Mohd Zin
2. Designing Reinforced Earth Wall for Seismic Areas 9
   Iqraz Nabi Khan, Swami Saran & Caroline Peter Diman
3. Study on Nylon Strip-soil Interaction 27
   Iqraz Nabi Khan & Swami Saran
4. Sampling of Beach Sand in Kerteh, Terengganu 37
   M.F. Ahmad, N.A. Zakaria & M.R. Selamat
5. A Study on the Relationship between Correlation Coefficient and Inverse Regression 45
   Ng Set Foong & Teoh Sian Hoon
6. A New Finite Difference Scheme Based on Centroidal Mean Averaging for the Goursat Problem 55
   Mohd Agos Salim Nasir & Ahmad Izani Md Ismail
7. A Comparative Study between Cu and Pb in the Speciation Study of Heavy Metals in a Stabilization Pond Treating Household Wastewater 63
   Lim Boon Tik

8. Design of Road Humps in Residential Area 75
Muhammad Akram Adnan, Teoh Sian Hoon & Lim Boon Tik

9. A Study of Temperature Variation in Closed Cars 87
Nor Hanim Abdul Rahman, Mohd Rozaiman Aziz &
Suzana Ab. Rahim

10. Motivating ESL Students Using Vocabulary Enrichment Games 95
Emily Jothee Mathai & Suchithra Nair

11. Penggunaan Teknologi Maklumat untuk Membantu Pembelajaran: Di Manakah Tahap Kesediaan Pelajar? 113
Peridah Bahari & Salina Hamed

12. Masjid Batu dan Masjid Papan, Kampung Pertama: Penjelas Kemelut Masyarakat Setempat 123
Zulkifli Dahalan

13. The Language of Genders in the "Labour of Love" 135
Suzana Ab. Rahim

Foreword

Welcome to ESTEEM Volume 2. In this issue, we address a gamut of topics from the engineering disciplines to language education. We hope that ESTEEM, by publishing articles from a diverse range of disciplines, will encourage debate and exchange among researchers from assorted academic backgrounds.

I would like to thank our advisor, Prof. Madya Mohd Zaki Abdullah for his distinctive imprint on this edition. His leadership of the journal in its 2nd year of growing impact and reputation has been outstanding. His vision, commitment to excellence, and attention to detail are widely recognized by the Penang academic community as determining factors in the journal's success so far. We will do our best to continue and expand on this tradition of excellence.

Since its launch in 2003, ESTEEM is indeed fortunate to have a dynamic Editorial Team. These people have provided the journal with an outstanding service of reviewing submissions for publications. The journal follows the established policy of a blind review process consisting of at least two peer reviewers per submission. We depend upon their knowledge and judgement in advancing the scope and utility of this journal. Without their support and enthusiasm none of this would have been possible. Also, my thanks to all the contributors, both the successful and not so successful.

Our vision of the ***ESTEEM*** journal is that it should be the journal that belongs to you, the academic and research community. This includes all engineers and academicians working to unravel the mysteries of research, teaching and learning, in all its facets. We wish the journal to be responsive to your needs and your interests. Please feel free to contact any of us in the editorial board to give us your ideas and suggestions for the development of the journal. We look forward to working with you all in expanding this emerging venue for communicating high quality research on the many aspects of academia.

Finally, I would like to take this opportunity to invite all authors and readers to contact me at **esteem@ppinang.uitm.edu.my** to share their comments and advice on how to further enhance the journal's value to the wider research community in knowledge and how to move ESTEEM to the next level of excellence.

The Chief Editor
May, 2005

Sampling of Beach Sand in Kerteh, Terengganu

M.F. Ahmad
N.A. Zakaria
M.R. Selamat

ABSTRACT

In soil investigation activity, it is normal that focus is made on sampling of undisturbed soft cohesive soils. Tri-axial test and consolidation test are the two key tests to be performed on these samples. At other sampling locations within a boring point, undisturbed sampling and SPT counts are sufficient. However in sandy areas, sampling is normally not carried out due to difficulty of holding the sample within the sampling tube during removal from the borehole. This paper related the experience in sampling of Kerteh Beach Sand in Kerteh, Terengganu. Kerteh which used to be a small town has now become the center of petrochemical industries in Malaysia. Major infrastructure work such as PETRONAS Gas Processing Plant, Kuantan-Kerteh Railway had been completed in the area. A special sampling tube was manufactured to sample the sand. The sampling was successful and assisted in understanding soil behaviour in the area when subjected to engineering activities.

Keywords: *soil investigation, sampling, borehole, Kerteh Beach Sand.*

Introduction

Malaysia in its quest to be a major developed country would necessitate land clearing and development to be undertaken. Development rests on land. Engineers need to understand the response of soil to the infrastructure development performed. Because soil varies, engineers have based on whatever available knowledge and experience to predict soil response.

It is now a mandatory requirement that soil investigation is conducted at proposed development areas. This is to safeguard the safety of workers,

The land in this area is generally low lying and undergoes seasonal flooding during the year end monsoons.

The coastal area is predominantly sand geologically identified as Kerteh Beach Sand. The area from River Kerteh to Kampung Labuhan to the north consists of meta-sedimentary rock. Because of rapid development, there is a need to accurately predict soil behaviour in the area.

Sampling of Kerteh Beach Sand

Sampling of sand is normally required to determine the sand quality for sand mining. Additionally it could also be used to determine the suitability of the sandy soil to be treated with deep compaction techniques such as dynamic compaction, vibro-compaction or blasting. This would require the determination of fines in the sand.

Typically in practice, there is no need to sample sandy soil. The usual practice in Malaysia is to conduct SPT tests and record the N values. This would then be correlated will the available semi-empirical relation to obtain either shear strength or relative density of the soil.

Sampling for sandy soil is a difficult activity. This is because of the weight of the soil and the lack of cohesiveness between the soil particles, the soil is bound to fall into the bored hole during recovery. A specially manufactured equipment has to be used to ensure recovery.

For the Kerteh beach sand sampling activities a total of thirty boreholes within 2 km stretching from river Kerteh southward were installed.

Fifteen of the boreholes were bored to 7.5 m depth and the remaining to 4.5 m depth. As planned, the activity was conducted in the month of May 2004. This coincided with dry season in the east coast. Wash boring technique which is the most common and acceptable technique according to BS 5930 was utilized on site (Figure 2 and Figure 3).

The original plan was to use normal N casing to sample the soil. As the depths planned were shallow, problem of sampling was not expected. The procedure for soil sampling was as per the following:

i. Advance the boring hole using the N casing shoe
ii. Once required depth was reached, the casing was removed
iii. U2 sampler was then advanced to the sampling depth

Figure 2: Soil Boring at the Site

Figure 3: Wash Boring Method Using Water to Assist Penetration

iv. A 5 kg hammer was used to push the sampler to the required depths of sampling
v. Once the required depth has been achieved, the sampler was raised and sample collected

However it was found that sandy soil could not be sampled by the normal sampler. Due to the inability to sample sandy soil using the normal sampler, special sampling equipment was developed. The special sampling equipment has satisfied the following requirement:

1. Tougher casing to prevent damage during installation using the 50 kg SPT hammer. (Figure 4)
2. Prevent the sandy soil within the sampling tube from dropping into the borehole.

Based on the above requirements, a special tube with dimension as per Table 1 was developed.

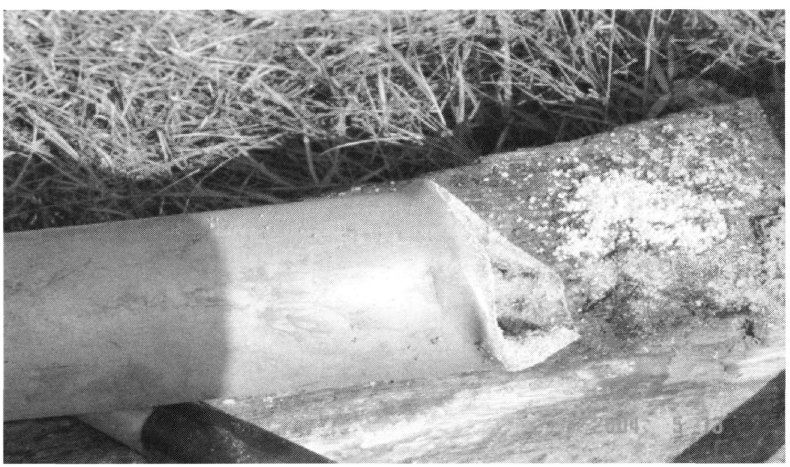

Figure 4: Damaged Sampling Tube

Table 1: Detail of Special Tube

Properties	Specification
Material	Steel
Length	0.7 m
Full sample length	0.6 m
Weight of tube	1.354 kg

Figure 5 and Figure 6 show the sampling tube and accessories. The sampling tube could withstand hard knocks by the 50 kg hammer during sampling. The accessories prevent the sampled sand from dropping into the borehole. The sampler can be used either with a door trap or with the sand trap. The door trap or sand trap allows sand to be sampled during penetration. Upon withdrawal from the borehole they block the sampled sandy soil from falling into the borehole.

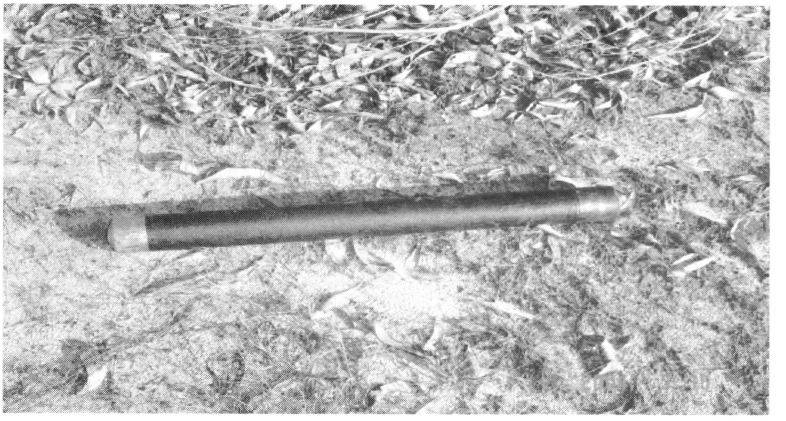

Figure 5: Special Sampling Tube

Figure 6: Sand Trap and Door Closer

The collection of sample from the sampling tube is shown in Figure 7. As per BS 5930:1981 requirement of undisturbed sampling for sieve analysis test, a minimum of 1 kg of sample was collected.

Figure 7: Collection of Sample from Sampling Tube

Discussion and Conclusion

Sampling of sand is beneficial for the sand mining industry and for determining the suitable type of ground technique (Mitchell, 1981).

Sampling of sandy soil is a rare and difficult exercise. The challenges faced in sampling of sand are as follows:

i. The existing normal N sampling tube has been found to be unsuitable for collection of sandy soil. The reason is because sand would fall into the borehole during withdrawal of casing.
ii. Casing was also prone to be damaged when driven into the sandy soil (Figure 4).
iii. The sampling process was slow as caution was required to prevent sample from dropping into the borehole.

The development of a new sampling tube and the accessories has helped sampling of sand at Kerteh beach. In addition, the use of very experienced and skilled operators for the boring machine has helped the sampling exercise to succeed. Nonetheless it was found that sampling

became very difficult when the depth reached 7 m. New equipment had to be developed to sample at deeper depth.

References

Ahmad, M.F., Zakaria, N.A., Selamat, M.R. (2002). "Ground Improvement Work for Kuantan-Kerteh Railway Project," Proceeding of Malaysian Universities Transport Research Forum, Universiti Malaya, Kuala Lumpur.

Mitchell, J.K. (1981). "Soil Improvement – State of the Art Report," Proceeding of 10th International Conference on Soil Mechanics and Foundation Engineering, Stockholm, Vol. 3, pp 509-565.

M.F. AHMAD, National Center for Rural Engineering Malaysia (CEREM), Faculty of Civil Engineering, UiTM Pulau Pinang

N.A. ZAKARIA, Director, River Engineering and Urban Drainage Research Centre, USM

M.R. SELAMAT, Head of Geotechnical Division, School of Civil Engineering, USM